

REMARKS

Claims 1 – 13, 15 – 36, 38 – 55, 57 – 62 and 65 – 71 are pending. By means of the present amendment, all pending claims are cancelled. New claims 72 – 106 are added.

In the official action, all claims were rejected as anticipated by U.S Patent No. 6,512,949, issued to Combs, et al. While it is respectfully asserted that not all limitations of all pending claims were anticipated by the Combs, et al patent, the pending claims have all been cancelled and new claims 72 – 106 have been presented which are believed to more clearly claim the invention.

Most limitations of the new claims correspond to limitations in the previously presented claims and are believed supported for the same teaching that supported the previously submitted claims. Some new limitations have been added and some language clarified.

Independent claims 72 and 87 now specifically include the limitation that delivery of the impedance measurement pulse is triggered responsive to and a within a defined interval of a cardiac event. This limitation is supported in the specification in paragraphs 85 – 87.

Claims 73, 75, 88 and 90 include the limitation that the impedance measurement pulse is delivered during the blanking period of a sense amplifier. This limitation is supported in paragraphs 97 - 99.

Claims 85, 86, 101 and 102 describe cross checking using a third electrode for determining the validity of the impedance data set more clearly than in the original claims. Support for this subject matter can be found in paragraphs 133 – 137.

Claims 103 – 106 state that the cardiac events in response to which the impedance measuring pulses are triggered may be sensed or paced ventricular events. These limitations are supported in paragraphs 85 – 87.

All other limitations of the newly presented claims correspond to limitations in the previously submitted claims and are believed supported by the same teachings in the specification.

The newly submitted claims are believed to clearly distinguish the invention from the cited Combs, et al patent. In Combs, et al., the measurement of fluid content is accomplished by extracting measurements of impedance made using an ongoing series of biphasic pulses which are already underway more or less continuously to measure another physiologic parameter, i.e. respiration. The present invention instead need only trigger delivery of impedance measurement pulses responsive to cardiac events, e.g. ventricular pacing and sensing, and preferably employs monophasic measurement pulses delivered during a blanking period of a sense amplifier. Modifying the device of the Combs, et al. patent to operate as claimed in the newly submitted claims is believed to be unobvious. Triggering delivery of impedance measurement pulses responsive to ventricular events and coupled thereto would be unnecessary if an ongoing series of biphasic impedance measurement pulses were generally underway to sense respiration, as in Combs, et al. Turning off the ongoing series of biphasic pulses would be unobvious as it would defeat the purpose of measuring respiration as described in Combs, et al. Modifying the biphasic pulses in Combs, et al. to become monophasic is contraindicated by the need for charge-balance in any prolonged series of applied pulses to avoid tissue damage.

Conclusion

All newly submitted claims are believed unobvious over Combs, et al. Contrary to Combs, et al. which teaches measuring fluid content using a mechanism which

already measures a related physiologic parameter (respiration), the invention as now claimed is directed to using a mechanism previously used as a diagnostic for testing the physical operability of the implanted device itself. This approach, while inconsistent with accomplishing the desired capabilities of the Combs, et al. device nonetheless provides advantages that cannot be realized with a device as disclosed in Combs, et al. and do not appear to be appreciated based on the disclosure of Combs, et al.

All newly submitted claims are therefore believed to be allowable over the Combs, et al patent. Examination of the newly presented claims is respectfully requested.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned attorney to attend to these matters.

The Commissioner is authorized to charge any deficiencies and credit any overpayments to Deposit Account No. 13-2546.

Respectfully submitted,

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